

The Canadian Entomologist.

VOL. III.

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NO. 1.

OUR THIRD VOLUME.

To all our friends and correspondents—to all who read these pages, we bid a kindly greeting. Once more we are entering upon a new volume; for the third time we solicit the attention and assistance of all lovers of nature throughout the continent—of all especially who delight in the study of the wonderfully varied forms, structure and habits of Insects. In addition, we now also desire to draw into our friendly circle of readers and observers in the same great field of nature, that numerous class of haters of insects, who hate them with a deadly hate, who give them no quarter in any case, and who devote them all alike to execration and unsparing destruction. Friends, we invite you all to come and join us in our work, which is one of deepest pleasure, even though often filled with toil; come with us and search into the mysteries of the insect world; help us to trace out the wondrous beauties of structure, form and coloring of these marvels of the Creator's power; help us to investigate thoroughly the lives, metamorphoses, habits, occupations, food, and all other matters connected with these tiny creatures; join us in working out their scientific arrangement and nomenclature; aid us in rightly discriminating between friend and foe, between noxious, beneficial and neutral insects, and let us all unite in the endeavour to discover the best means of counteracting the ravages of the one, and of encouraging and protecting the other.

In this work all can do something; not only the laborious student of Entomology and the ardent collector of insects, but multitudes of others as well. Every fruit grower, farmer and gardener, every one who cultivates even a square yard of ground, has constant opportunities of learning new facts respecting these ubiquitous creatures, and can, if he but will, add much to our knowledge of them. Careful observation is the first and most important operation, and next the accurate record of the facts observed. It is astonishing how much can be learnt in a single season by any one who will but open his eyes to what is going on about him, and how much true pleasure can be derived from the contemplation. We beg, then, kindly reader, that if you are not already like ourselves a devotee at this particular shrine of Nature, that you will make use of this joyous spring time that has opened upon us, and become initiated into the mysteries of this alluring science. It is a branch of knowledge the pages whereof are open to all, the secrets of which are ready to be disclosed to every enquirer. It requires no costly apparatus, no long journeys in search of materials; its

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FIG. 1.

Color: apple green; mauve stripes; orange stigmata.



FIG. 2.

Color: dark reddish-brown.



FIG. 3.

Color: black and brown, with fawn-colored white.

THE PLUM SPHINX MOTH.

Sphinx drupiferarum (Smith & Abbott).

BY E. B. REED, LONDON, ONT.

As this moth pretty generally makes its appearance in our plum orchards from year to year, I have thought it advisable to give a short history of its different stages for the benefit of our fruit-growers.

It is a member of a family of moths to which the great naturalist Linnaeus gave the name of *Sphingidae*, on account of the resemblance he conceived some of their caterpillars bore, in certain positions, to the notorious Egyptian Sphinx, and which our artist has faithfully represented in the engraving of the larva—fig. 1. While the ravages caused by this caterpillar are fortunately not very extensive, yet it generally appears in different localities from time to time in numbers quite sufficient to cause considerable annoyance to the plum growers of those regions. Its conspicuous size, when full grown, and its bright green colored body, and mauve stripes, make it tolerably easy of detection; while the leafless twigs, the result of the voracious appetite necessary to sustain its huge carcass, are sure to cause the eyes of the observant fruit-grower to make diligent search after this monster leaf-eater.

The larva (fig. 1) is hatched from an egg deposited (probably) singly on the under side of the leaf.

Mr. Wm. Saunders has kindly allowed me to make use of his notes on the appearance of the young larvæ.

On the 2nd of July, a pair of *drupiferarum* were brought to him which had been taken *in coitu*. They were confined together in a seidlitz box. The next day the female began depositing eggs, continuing to do so for two or three days.

"Egg: Length .07 inch; slightly oval; surface smooth; color pale yellowish green. In from 6 to 8 days, the young larvæ made their appearance, having eaten their way out through the side of the egg. In some cases one half or more of the egg-shell was eaten; in others only a hole just large enough to allow of the escape of the larva, while in a few cases it was almost entirely consumed.

July 10.—Some out this morning, length .22 inch; head very large, rounded, pale yellowish-green, with a few very short whitish hairs; mandibles tipped with dark brown; body above pale yellowish-green, with a few whitish slightly elevated tubercles on every segment, from each of which arises a single short fine hair, those along each side of the dorsal line dark brown, the others yellowish white. The tubercles are arranged in a double transverse row on the middle and hind segments; caudal horn .10 inch long, nearly erect, black, thickly covered with very short stiffish black hairs slightly furcate at the apex. Each tip terminated by a pale brownish hair longer than the others; under surface similar to upper."

The larva, when full grown, measures about three or three and a half inches. Its color is a beautiful apple green. The head is also green, with lateral dark

brown or black stripes. On each side of the body are seven broad oblique bands of a white color, bordered in front with light purple or mauve. The stigmata or breathing pores are very distinct, and are of a bright orange-yellow color. The caudal horn is long, of a dark brown color, with a yellow tint at the base of the sides. The body is cylindrical in form, and is smooth to the touch. The caterpillar, after satisfying its appetite, or on any sudden alarm, assumes the peculiar rigid appearance shown in the cut, and will remain thus, with its head raised, for a considerable period. The formidable-looking horn on the last segment gives the insect a rather alarming appearance; but it is perfectly harmless, and in fact even at this date naturalists can find no use either for offensive or defensive purposes, for this horn, which is peculiar to nearly all the caterpillars of the *Sphingideæ*. The larva of the Plum Sphinx is generally found in Ontario about the month of July or the early part of August. When it has attained its maturity it ceases eating, and seeks shelter in the earth, where it excavates for itself a convenient chamber which it lines with a water-proof, gummy cement, and there undergoes its transformation into the pupa or chrysalis state.

The pupa (fig. 2) is about $1\frac{1}{2}$ inches in length; its color is dark reddish-brown, and it has a short thick projecting, or as naturalists term it, exserted tongue case. The insect remains in the ground all through the winter and spring, and emerges in its perfect winged state about the early part of June.

The moth (fig. 3) is a large one, its wings expanding from $3\frac{1}{2}$ to $4\frac{1}{4}$ inches. The body is about $1\frac{1}{2}$ inches long, varying slightly in the sexes as to length, that of the female being shorter, somewhat thicker, and more obtuse at the anal segment, while that of the male is longer and tapers almost to a point. Describing this moth from five specimens (2 male and 3 female) now before me, there appears very little difference in the markings of male and female. The antennæ are slightly different, but it requires some slight experience in Entomology to ascertain it. The head and thorax, which are large and thick, are blackish-brown with a whitish fawn color at the side. The eyes are very prominent. The snout-like projection is composed of the *palpi*, or feelers, which are two close-fitting shields for the protection of the proboscis, which lies snugly coiled up between them like the mainspring of a watch. This proboscis or tongue which is shewn in the engraving (fig. 3) is as long as the body of the moth, and is used by the insect in extracting from flowers the honey, which forms its chief food. To a watchful observer, a sphinx moth presents a most curious appearance, not unlike that of a humming bird, while it hovers over some flower bed with its wings humming from their rapid and ceaseless beating, its body poised in the air, and its long tongue projecting like the beak of a bird, and dipping from time to time into the innermost recesses of the various flowers in search of food.

The body of the moth is brown, with a black central line and a black band on either side containing four or five dingy white spots. On the back of the thorax are several fawn-colored blotches or markings which are peculiar to many

of the *Sphingidæ*, and which some of our readers may possibly have noticed in the striking resemblance to a human skull on the thorax of the English death's head moth, *Acherontia atropos*. The wings are long and very narrow, but possessing great strength and evidently adapted for great swiftness. Their general color is dark purplish-brown, with a stripe of white on the front edge extending from the white sides of the head, and with a fawn-colored stripe on the outer edge of the front wing. The hind wings have two whitish wavy stripes with a similar fawn-colored stripe on their outer edge. There are also three or four black oblique streaks on the fore-wings, and generally a black dot on the white stripe.

The engravings of this insect are the work of Mr. C. J. Beale, of Toronto, Ont. That of the pupa and larva are adapted, with some alterations, from the excellent designs of Professor Townend Glover, of Washington. But the beautiful figure of the moth was engraved by Mr. Beale from a specimen in my own collection, and is an admirable *fac simile* of the original insect.

QUEBEC CURRANT WORMS.

BY G. J. BOWLES.

In May last I became the tenant of a house in a central part of the city of Quebec. To this house is attached a garden, which contains a few plum trees, and a considerable number of currant and gooseberry bushes. The plants, however, are very old, and as the garden has been neglected, noxious insects have increased and multiplied to no small degree. I intend in this paper to give my experiences as regards the currant and gooseberry bushes, leaving the rest till another time, and trust that I shall be able to add something to the history of the insects, unfortunately too common, which infest these small fruits.

No sooner had the currants and gooseberries expanded their leaves, than I observed, here and there upon them, a few green caterpillars about half an inch or more in length, which seemed to be in a healthy and flourishing condition. I did not molest them, feeling rather pleased at the idea of having something of the kind to study so near home; and as I intended looking after them when they had grown larger, I did not examine them very closely. In a few days, however, these green caterpillars had disappeared, but the bushes swarmed with another larva, which, to my surprise, I soon found to be those of the notorious currant saw-fly (*Nematus ventricosus*.) Whether or not the green ones I first noticed were larvæ of this species in their last stage, I cannot now say; but if they were, it certainly is a corroboration of Mr. Saunders' conjecture, that some individuals hibernate in that state. The currant unfolds its leaves very quickly, and these green caterpillars (which were not geometers), made their appearance almost as soon as the bushes were covered with foliage. Their disappearance so soon afterwards is also a fact which would favor the idea of their being the larvæ of this sawfly.

By the middle of June, the spring brood of *ventricosus* swarmed on the red currants and gooseberries, almost stripping the leaves from some of the bushes. Larvæ of all ages and sizes, from one tenth of an inch to an inch in length, might be found upon a single leaf; some in their old coats of green and black, and some of the largest in their new ones of green only. At the same time the pretty speckled caterpillars of *Ellopia* (*Abraxis*) *ribearia*, Fitch, appeared in almost equal numbers. They were more common, however, on the black and red currants than on the gooseberries. The fact of this larva thus feeding on the black currant, disproves the assertion of that eminent entomologist, the late Mr. Walsh, who states [see *Am. Entomologist*, vol. 2, page 13] that none of the currant worms attack that plant.

As the fruit was not ripe, I did not wish to apply hellebore, but set all hands to work picking off the depredators, and dropping them into a basin of water. In this way at least a pint of larvæ of both species were gathered daily for a week, and a very apparent diminution made in their numbers. About the 20th June, I began to find cocoons of *ventricosus*, some fastened singly to the surface of a leaf, some in groups of two or three in the forks of the branches. Of these I gathered sixteen, and having put them in a bottle, in about ten days twelve flies emerged, the remaining four dying in their cocoons, as I subsequently ascer-

tained. These twelve specimens were all males, and I also noticed the males about the bushes several days before the females appeared, although I searched carefully for the latter. At length, about the middle of July, I detected the females on the under side of the leaves laying their eggs in the usual manner, and killed many while engaged in this operation. As soon as the fruit had been picked, I dusted the bushes with hellebore, and found it to be, as reported, a *specific*, completely destroying the *ventricosus* larvæ which came in contact with it, though it did not seem to be so effective in the case of the *Ellopia*. By the end of July, the saw flies [see accompanying figure of sawfly, magnified] and

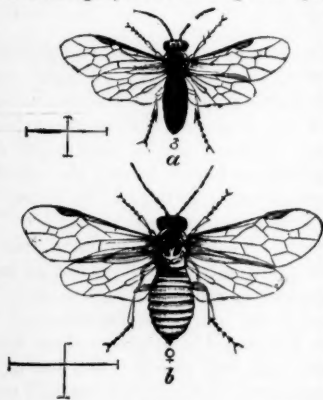


Fig. 4.

their larvæ had been very much reduced in number, and the geometers which had escaped destruction had passed into the pupa state. On searching at the roots of the bushes, I found many of these pupæ naked in the earth, and a few days afterwards the moths began to appear in great numbers. The net now came into use, and catching half a dozen at a sweep was an ordinary affair, when clouds of them would rise on disturbing a bush. After killing some hundreds in this way, they gradually disappeared, and my two friends were invisible for the rest of the season, with the exception of a few larvæ of *ventricosus*, which I

now and then discovered, some even in October. I had occasion during that month to remove two of the gooseberry bushes which had been infested, and although I carefully examined the earth from their roots, I could not find any sawfly cocoons. About the same time I examined a dying plum tree which grew near, the bark of which was loose and full of holes, in which, as well as in the forks of the branches within three feet from the ground I discovered many of them. From this it might be inferred that these larvæ do not *invariably* seek the earth before pupating in autumn, but sometimes follow the example of their predecessors, and construct their cocoons in a sheltered place above ground.

I have made enquiries as to the extent of the depredations of these two insects in this vicinity, and find that in some gardens the *ventricosus* has not yet appeared. Where it has gained a footing, however, it is a worse enemy than the *Ellopiæ*, though the latter is often very numerous and destructive. It seems to be admitted that an imported insect, in America at least, soon becomes a greater pest than the native which attacks the same plant.



Fig. 5.

Nor were these the only foes I had to contend with. In July, *Egeria tipuliformis* [see fig. 5] came out by dozens, in its pretty dress of steel blue and gold, but met with no mercy despite its beauty. The red currant bushes, which had stood in the garden for a long time, were examined in autumn, and nearly every twig found perforated by this little enemy. I also found a dead pupa of this

moth in a stem of white raspberry growing near, within a burrow about three inches in length, which the larva had excavated in the pith.

While searching for the cocoons of *ventricosus* in the currant bushes, I found several pretty chrysalids, which I secured. The moth these produced was *Angerona Crocataria*, Guenée, and as I shortly afterwards captured some caterpillars of the same species on the red currant, I am able to give a partial history of the insect. I am, however, indebted to Mr. Saunders, of London, Ontario, for descriptions of the egg and newly-hatched larva, he having kindly placed his notes at my disposal. They are as follows:—

"On the 27th of June, a female laid in a box in which she was confined, about 220 eggs. They were laid in patches or clusters on different parts of the box, containing each from 10 to 40 or 50 eggs. When first deposited, they were yellow, but in a day or two afterwards they changed to a bright red, and on the 4th July some which were about to hatch had turned greyish-brown, soon after which the young larvæ made their appearance. Some still remained red at this date (4th), but all changed to greyish brown before the appearance of the larvæ. They were all hatched by the 7th of July.

"Egg: oval, with a depression above; length, .03 of an inch; greatest width .02 inch. The depression above in each egg led me to think that they were barren and drying up, but in this I was agreeably disappointed. Surface nearly smooth under an ordinary magnifier, but under a power of 45 diameters there appear a number of very shallow, small depressions over its whole surface.

"Newly hatched larva : length, .10 inch ; head rather large, bilobed, pale brown with a few fine short hairs and several black dots on each side. Body above, dull yellowish-green, with a dark brown stripe on each side, about half way towards spiracles. Below this the sides of the body are paler, with a whitish bloom over the surface. There are a few short brownish hairs, most numerous on terminal segment. Under surface pale whitish, with a dusky patch of red about the base of the two pairs of prolegs. Feet and prolegs pale, semi-transparent."

Mature Larva (Quebec.) Fed on red currant. Length, 1.50 to 1.75 inch ; body gradually increasing in size from head to prolegs ; general colour, yellowish green.

Head square and flattened above, with three longitudinal purplish brown and whitish stripes, which are continued on first segment. There are also two small projections like rudimentary antennæ, one on each side of head, .03 long.

Body yellowish-green, an indistinct whitish dorsal line, a rather broad whitish line on each side, just below spiracles, bordered above with faint purple, which increases in depth of colour towards the posterior rings, and becomes a purple stripe on anal prolegs, forming a resemblance to an inverted A. Beneath, same colour as above, but with faint interrupted longitudinal lines. Spiracles white, bordered with purple. Above, on each segment, from 2nd to 7th inclusive, are five minute black dots (four in a square and one in front towards the head), and all the rings have a yellowish band on the swelled part where the succeeding segment is inserted. Legs pale green.

The pupa is .50 to .60 inch. in length, and of a dark olive green colour, with the exception of the abdomen, which is pale greenish yellow, and has a row of black dots on each side, and another dorsal row. The wing cases are very prominent, and from their strong contrast with the abdomen in colour make the chrysalis a pretty object. I found them fastened by the tail, and reposing in a slight net-work of silken threads, with which the caterpillar had drawn the edges of a currant leaf half way together, so as to form a kind of cradle. The structure could not be called a cocoon, in fact the chrysalis, which is very lively, had wriggled itself out of its bed in some cases, and hung outside fastened only by the tail. The moth appeared in July, from 10 to 14 days after pupating. It will be seen that it emerges somewhat earlier in the season at Quebec than at London, judging from the dates given by Mr. Saunders.

On the 28th June, I took a *Grapta* larva, almost full grown, from a red currant bush, and after feeding it a few days it became a pupa, and duly produced the butterfly, which, after some hesitation, I have referred to *Grapta progne*. Mr. Saunders says that "it approaches very near to *faunus*, but resembles *progne* still more, though the markings are deeper and richer than usual." The following is a description of the larva:—

Mature Larva: Fed on red currant; length 1.30th inch; cylindrical; general color, yellow.

Head: Medium, flattened, reddish, a blackish triangular spot in front, and a wedge-shaped one on each side, some short whitish hairs, and two black branching horns, mandibles black.

Body: Striped transversely with narrow black and yellow lines; small thorns on second segment; six branching spines each on third and fourth segments; seven each on remaining ones, viz.: three on back, yellow; one each side, orange; and one each side, below spiracles, yellow, out of an orange tubercle; spiracles black, encircled with yellow. Four small black dashes on upper part of each segment, viz.: two on each side above second row of spines, and extending backwards diagonally towards each other. Feet reddish, with a black mark on outer side. When at rest, the caterpillar often coils round the stalk of a leaf, with the hinder part of its body raised in the air.

The general colour of the chrysalis is dark umber brown, slightly mottled with a lighter shade. It has a silvery spot on under side between thorax and abdomen, and is suspended by the tail. The caterpillar became a chrysalis on the 3rd of July, and the perfect insect emerged on the 13th.

On the 3rd of August my attention was drawn to a small black-currant bush by its peculiar appearance. On a closer examination, I found a number of geometric caterpillars, which were resting themselves in their customary manner, by clinging to the branches with their anal legs, and holding their bodies extended. At a little distance they closely resembled the bare stalks of leaves, and it was this resemblance which led me to seek the cause of the bush being affected in such a manner. I gathered twenty-four of these caterpillars, which were all nearly full grown, and fed them on black-currant leaves in a box of earth; but by the 7th of August they had all descended and changed to pupæ on or just beneath the surface of the ground, without forming any cocoon.

The following is a description of this larva:—

Mature larva: Fed on black currant; length 1.75 to 2.00 inches; nearly cylindrical, gradually enlarging to posterior extremity; general color, pea green.

Head: Greyish green, strongly bilobed.

Body: Pale green, with a darker green interrupted dorsal line, and indistinct broken transverse lines of same color; a yellow cross line on posterior end of each segment, and two small tubercles on second segment close to head. The body is also dotted with very small whitish tubercles, and a few short black hairs .04 inch long; spiracles reddish; feet pale green. Some of the largest of these larvæ had a small brown tubercle on each side in front of each spiracle on segment before first pair of prolegs, and a purplish brown ridge on last segment from one spiracle to the other.

The pupa is .60 to .70 inch long, very stout, and of a dark brown color, with a strong point or thorn at the end of the abdomen. With this exception, it has nothing to distinguish it from that of many of the Bombycidae. The abdomen is slightly flexible.

These pupæ had remained so long in the earth (since August last), without producing the moth, that I became impatient, and brought a few in a small box

into a warm room, hoping to hasten their development. On the 2nd of April, I was rewarded by finding in the box a very fine female specimen of that handsome grey geometer, *Amphidasys cognataria*, Guenee, which had escaped from one of the chrysalids, and was the first of the species I had seen alive since 1864.

I had thus no less than *six* different species preying upon my currants and gooseberries, viz.: *Nematus ventricosus*, *Ellopiæ ribearia*, *Egeria tipuliformis*, *Angerona crocatoria*, *Grapta prognæ*, and *Amphidasys cognataria*. Of these, the saw-fly, *Nematus ventricosus*, was decidedly the most destructive. There is still another insect, a dipterous fly, which I have not yet seen in my garden, but observed in others some years ago, and which lives in the fruit of the red and white currant. The history of this fly I hope to investigate during next summer.

HINTS TO FRUIT GROWERS.

Paper No. 1.

BY. W. SAUNDERS, LONDON, ONT.

To make the ENTOMOLOGIST more interesting and useful to fruit growers, it is intended to devote a page of every number issued during the summer season to giving practical hints in reference to insects whose times of appearance may be near at hand, with a condensed summary of such means and remedies as have been found most serviceable in lessening the numbers of such as are injurious. We shall be glad to receive communications from fruit growers, relating to any new insect pests occurring in their neighborhood.

The Plum Curculio (*Conotrachelus nenuphar*). Now is the time to try Ransom's method of trapping the curculio. It may be practiced any time during May and continued with success till early in June. Have the ground made quite smooth and clean for several feet around the base of the tree, and place a few pieces of chip, bark or shingle close around and against the trunk. These will afford convenient hiding places for the insect. They should be turned over and examined once or twice a day, when the curculios will be found attached to the under side, and they can be picked off and destroyed.

It is not expected that this will supersede jarring entirely, but will no doubt, if persevered in, prove a valuable means towards lessening the numbers of this terrible foe to plum culture.

The Tent Caterpillar (*Clisiocampa americana*). The ring-like nests of eggs of this species, so common on the twigs and small branches of fruit trees, are now hatched, and the young caterpillars forming webs in which to shelter themselves. If allowed to proceed and grow without interference, they will soon strip the branches of the trees on which they are located entirely bare, and thus produce an unsightly deformity as well as check the vigor of the tree. Where the affected branches are low, the webs may be removed by the hand and the

insects crushed, and where they are high, the nests may be brought down by means of a pole with a bunch of rags tied to the extremity.

The black Cherry Aphis (*Aphis cerasi*). This disgusting looking little creature begins to appear almost as soon as the foliage is expanded, and multiplies so fast that the under side of the young leaves are soon almost entirely covered with them, and the growth stunted by their continual puncturing and sucking of the juices.

Drenching the tree with weak lye, strong soap suds, or tobacco water, are remedies which have been used with success; but probably nothing is better than the means which Nature employs to keep these creatures within bounds—that is, by the multiplication of their natural enemies. If we assist Nature in this way by introducing into their midst a few Lady Birds, we shall find their numbers soon decrease; for the Lady Birds feed on the Aphis incessantly, as well in the larval or caterpillar stage of their existence as in the perfect beetle state; and when they have abundance of food they multiply very fast. Figures are here given of some of our common species:—

Figure 6 is the larva of a Lady Bird. Figure 7 represents the species known as the 13 spotted Lady Bird (*Hippodamia 13 maculata*); and Figure 8 the 9 spotted Lady Bird (*Coccinella 9 notata*).



Fig. 6.



Fig. 7.



Fig. 8.

The Bud-moth Caterpillar (*Grapholitha oculana*). Be on the look out for this mischievous little creature—a tiny, pale, dull-brown worm, which is fond of locating itself about the base of the blossom buds where, tying the various flowers or newly-formed fruits together with silken threads, it revels on their substance, soon causing them to blacken and wither. To the amateur fruit grower, whose garden and crop is comparatively small, these are often particularly annoying, and destroy hopes fondly cherished. We know of no better plan than that of hunting this creature out and destroying it by hand. Its presence is soon made apparent by the unhealthy and withered look of the affected buds. Figure 9 represents both the caterpillar and moth of this species.



Fig. 9.

LONDON BRANCH OF ENTOMOLOGICAL SOCIETY OF ONTARIO.

The regular monthly meeting of the London branch was held on Tuesday evening, the 3rd ult., at the residence of the Vice-President, Mr. J. H. Griffiths.

A report of the proceedings of the Parent Society at the Toronto meeting was given by Messrs. Reed and Saunders, in all of which the members heartily

concurrent. The requisite alterations were then made in the by-laws to bring them into conformity with the new constitution.

Mr. W. Saunders read a letter from Mr. J. T. Whiteaves, Secretary of the Natural History Society, of Montreal, stating that Mrs. Ritchie had accepted the offer of the London branch for the purchase of the cabinet of insects belonging to the late Mr. A. S. Ritchie.

Several of the members brought with them excellent microscopes, which added greatly to the interest of the proceedings. Many entomological objects were thus submitted to high magnifying powers, and the marvellous details of their structure clearly shown.

ENTOMOLOGICAL GLEANINGS.

[PAPER NO. 4.]

BY W. SAUNDERS, LONDON, ONT.

The eggs of the Vaporer Moth, Orgyia leucostigma.

Attentive readers of the Entomological portion of the late Report of the Commissioner of Agriculture for the Province of Ontario, will have noted the fact already well known to Entomologists that the female moth of this species is wingless, and lays her eggs on the outside of the cocoon from which she has escaped. Last fall the moths were unusually common, and their nests of eggs are now so abundantly distributed among our fruit trees, that unless some effort is made to destroy them, the larvæ will probably be exceedingly numerous and destructive during the approaching season.

Fig. 10 represents the full grown caterpillar of this species, which, when about to change to chrysalis, selects a leaf on which to undergo its next transformation, and this in such a position that, while the chrysalis is firmly attached to it on the one side, it is firmly secured by silken threads to the under side of a branch on the other, thus securing the leaf from falling to the ground in the autumn. The female, after its escape from the cocoon, rarely moves more than a few inches from it, waiting the attendance of the male moth, after which she at once commences to place her eggs in the position already indicated. But how are the eggs, when laid, kept in their place on the top of the cocoon? Dr. Fitch says that the eggs are extruded in a continuous string, which is folded and matted together so as to form an irregular mass. On removing this mass of eggs from its place of attachment, the surface of the cocoon appears covered with fragments of a transparent gelatinous looking substance, which has evidently been applied in a fluid state.

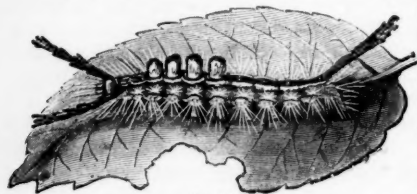


Fig. 10.

The bottom layer of eggs will usually number 100 or more, and their interstices are well filled with this same gelatinous substance, which adheres so strongly to the eggs that when the nest is torn open they cannot be separated without bringing away portions of this material firmly attached. Another irregular layer of eggs is placed on this, then a third, and sometimes a fourth, before the total number is exhausted, and through the whole of these the gelatinous matter is so placed as to secure every egg, not by being imbedded in a solid mass, but surrounded by the material worked into a spongy or frothy state. Possibly this may be to economize the amount used. Over all is a heavy layer of the same with a nearly smooth greyish white surface, the whole number of eggs being placed so as to present a convex surface to the weather, which effectually prevents the lodgement of any water on it.

Within this enclosure are deposited from 375 to 500 eggs. We give these numbers because we have counted the contents of several, and 375 is the lowest number and 500 the highest we have found. The egg is nearly globular, flattened at the upper side—not perceptibly hollowed—with a dark point in the centre of the flattened portion surrounded by a dusky halo. Its surface is smooth under a magnifying power of 45 diameters; but when submitted to a higher power, appears lightly punctured with minute dots. Its color is uniformly white to the unaided vision; but the microscope reveals a ring of dusky yellow surrounding it immediately below the flattened portion. Its diameter is 1-25th of an inch.

A careless observer seeing a dead leaf here and there upon his trees might readily conceive that it was accidentally blown into the position it occupied, and perhaps held there by a spider's web or something of that sort; but as will be seen from what we have said, a closer examination will furnish food for thought, in the wise arrangements made by the parent moth in providing for the safety of her future offspring; and at the same time may well excite alarm in the fruit grower's mind when he perceives promise of the approaching birth of such a horde of hungry caterpillars as even one of these will produce.

MISCELLANEOUS NOTES.

COLEOPTERA.—The following notes upon the localities for finding certain species of *Coleoptera*, all taken in April, in Massachusetts, may be of some use to collectors:—

Under much decayed butternut bark were found *Omosita colon*, *Hister Lecontei*, *Ips fasciatus*, *Phenolia grossa*, *Cucujus clavipes*, and *Cossonus platanea*. About fresh-cut maple and birch stumps where the sap was flowing, *Ips fasciatus*, and *sanguinolentus*, and *Staphylinidae* of various species. Under loose pine bark, *Boros unicolor* and *Rhagium lineatum*. Around fresh cut pine wood where the pitch was oozing out on sunny days, *Tomicus pini*, *Hylurgus terebrans*, *Pissodes strobi*, *Hylobius pales*, *Clerus nigripes*, and *trifasciatus*, were very abundant.

To collect those species of *Scolytidae* and *Cureulionidae* that live upon pine, it will be found very successful to go out just at dusk after a sunny day, when they have taken refuge under the chips about fresh cut pine wood-piles. They can then be taken in abundance.—GEO. DIMMOCK, SPRINGFIELD, MASS.

OMISSION.—A valuable paper by V. T. Chambers, Esq., of Covington, Kentucky, U.S., on "A New Species of *Cenistoma*"—one of our Canadian *Micro-lepidoptera*, belonging to the family *Tineina*—was received too late for insertion in the present number, but will appear in our next, which we hope to issue during the month.—ED. CAN. ENT.

REMITTANCES

RECEIVED SINCE JANUARY 1ST, 1871.

J. G. G., Toronto, \$1; R. V. R., Kingston, \$6; G.D., Springfield, Mass., \$2.24; T. L. M., New York, \$1.12; O. S. W., Chicago, \$3.37; J. P., Grimsby, \$2; Dr. M., Grimsby, \$2; A.S.F., New York, \$1.80; V.T.C., Covington, Ky., \$1.12; Dr. E.S.H., Grand Rapids, Mich., \$4; Dr. G., Bayfield, \$1; J.M.J., Halifax, N.S., \$3; W.H.E., Toronto, \$1; J.B., San Francisco, Cal., \$4.45; C. J. S. B., Port Hope, \$1; N.H.C., Stratford, \$2; P.S.M., Detroit, Mich., \$1.

EXCHANGES, &c.

LEPIDOPTERA.—Canadian Lepidoptera desired in exchange for British.—E. H. COLLINS, *Daily News* office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange, English or other European species.—CHAS. GEO. ROTHERAM-WEBSDALE, 78 High-street, Barnstaple, England.

COLEOPTERA AND LEPIDOPTERA.—I have a few *Cychrus Andrewsii* and *Ridingsii*, which I should like to exchange for rare Canadian insects: Lepidoptera preferred.—THEODORE L. MEAD, 596 Madison Avenue, New York.

COLEOPTERA.—I should be pleased to exchange coleoptera with some Canadian Coleopterists, or would purchase species not found in my locality.—ANDREW S. FULLER, Woodside Garden, Ridgewood, Bergen Co., N. J.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P.Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J.Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

ADVERTISEMENT.

CORKS AND PINS.—We have received a fresh supply from England, of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, No's. 1 to 6, price 50 cents (gold) per packet of 500. Orders will please state whether the package is to be sent by mail or express.

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